

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
12 April 2001 (12.04.2001)

PCT

(10) International Publication Number
WO 01/25687 A1

(51) International Patent Classification⁷: **F21V 21/36**,
E04H 12/18, 12/34

(21) International Application Number: PCT/AU00/01208

(22) International Filing Date: 4 October 2000 (04.10.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PQ 3251 5 October 1999 (05.10.1999) AU

(71) Applicant and

(72) Inventor: **PANNEKOEK, Robert, John** [AU/AU]; 21
Victoria Circle, Mandurah, W.A. 6210 (AU).

(74) Agent: **LORD AND COMPANY**; 4 Douro Place, West
Perth, W.A. 6005 (AU).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

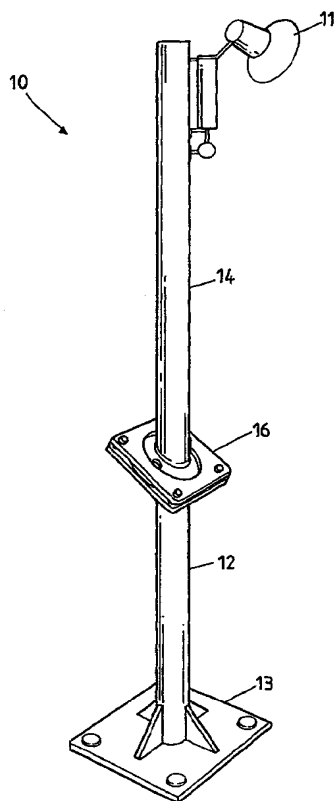
Published:

— With international search report.

[Continued on next page]

(54) Title: **ELONGATE MEMBER WITH INTERCONNECTED ROTATABLE PORTIONS**

(57) Abstract: An elongate member (10) having a first elongate portion (12), a second elongate portion (14) and an interconnecting means (16). The interconnecting means (16) is disposed at an acute angle to the first elongate portion (12) and rotation of the second elongate portion (14) about the interconnecting means (16) allows a user access to an article (11) located at the upper end of the second elongate portion (14).



WO 01/25687 A1



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

TITLE**ELONGATE MEMBER WITH INTERCONNECTED ROTATABLE PORTIONS**

5

FIELD OF THE INVENTION

The invention relates to an elongate member for locating an article in a location remote from a base plane.

10

It is known to provide an elongate member in the form of a pole for locating an article such as a light source in a location upwardly of and remote from a base position such as on the ground or an elevated platform. Such poles are commonly used in processing plants and refineries for illuminating the plant at night.

15

At present, one method of servicing or replacing the articles is by incorporating into the pole means for selectively permitting the pole to pivot about a substantially horizontal axis. In this way, the pole may be manually manipulated by a user to bring a remote end of the pole and thereby the article to a location sufficiently close to the user.

20

However, such poles may be in excess of 2 metres in length and as a consequence it may be difficult to safely manipulate the pole. In particular, there exists a significant risk of injury to persons adjacent the pole should the pole inadvertently fall.

An alternative known method of servicing or replacing the articles is to use a ladder. However, the use of ladders is particularly problematic in processing plants and refineries as the level of activity in the plant or refinery is generally high and the risk of unintentional dislodgment of the ladder is high.

25

The present invention seeks, therefore, among other things, to provide an elongate member which overcomes at least some of the above mentioned disadvantages.

SUMMARY OF THE PRESENT INVENTION

30

In accordance with an aspect of the present invention, there is provided an elongate member for locating an article remote from a base position, characterised in that the elongate member comprises a first elongate portion, the first elongate portion extending, in use, from the base position, a second elongate portion, the second elongate portion adapted to receive the article, and interconnecting means, the interconnecting means being arranged to connect the first elongate portion to the

second elongate portion and to permit relative rotation of the first and second portions about an axis of rotation, the axis of rotation being disposed at an acute angle relative to a longitudinal axis of the first elongate portion.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:-

Figure 1 is a diagrammatic perspective view of an elongate member in accordance with the present invention;

Figure 2 is a diagrammatic perspective view of a portion of the elongate member shown in Figure 1;

Figure 3 is a diagrammatic exploded cross sectional view of the elongate member shown in Figures 1 and 2;

Figure 4a is an upper plan view of a first plate member of an interconnecting means of the elongate member shown in Figures 1 to 3;

Figure 4b is a side view of the first plate member of Figure 4a;

Figure 5a is a lower plan view of a second plate member of an interconnecting means of the elongate member shown in Figures 1 to 3;

Figure 5b is a side view of the second plate member of Figure 5a;

Figure 6a is an upper plan view of a third plate member of an interconnecting means of the elongate member shown in Figures 1 to 3;

Figure 6b is an upper plan view of third plate member of Figure 6a;

Figure 7 is a diagrammatic cross sectional view of the elongate member shown in Figures 1, 2 and 3 with the elongate member shown in a first orientation and;

Figure 8 is a diagrammatic cross sectional view of the elongate member shown in Figures 1 and 2 with the elongate member shown in a second orientation.

DESCRIPTION OF THE INVENTION

Referring to the drawings, there is shown an elongate member 10 for locating an article such as a light source 11 in a location upwardly of and remote from a base position 13 which may be on the ground or on an elevated platform.

In this example, the article will be taken to be a light source 11. However, it will be appreciated that other articles are envisaged, for example a flag or an antenna.

The elongate member 10 includes a first elongate portion 12, a second elongate portion 14 and interconnecting means 16 which is disposed between the first elongate portion 12 and the second elongate portion 14.

The first elongate portion 12 is substantially cylindrical in shape and is fixed at a lower end to the base position 13, and extends upwardly of the base position 13 to the interconnecting means 16.

The second elongate portion 14 is substantially cylindrical in shape and extends from the interconnecting means 16 to the light source 11.

The interconnecting means 16 includes a first plate member 18 which is fixedly connected to an upper end of the first elongate portion 12 at an acute angle relative to a longitudinal axis of the first elongate portion 12. The first plate member 18 has an upper surface 19 which faces away from the first elongate portion 12. The interconnecting means 16 further includes a second plate member 20 which is fixedly connected to a lower end of the second portion 14 at an acute angle relative to a longitudinal axis of the second portion 14. The second plate member 20 has a lower surface 21 which faces away from the second elongate portion 14. The acute angle of the first plate member 18 is preferably equal to that of the second plate member 20, and preferably is in the range 30°-60°. The interconnecting means 16 also includes a fixing means including a third plate member 22 which is separate from the first elongate portion 12 and the second elongate portion 14.

The first, second and third plate members 18, 20 and 22 are shown more particularly in Figures 4, 5 and 6. The first plate member 18 includes a first substantially square shaped portion 23 provided with a generally centrally disposed first aperture 24 and four second apertures 26 each of which is disposed adjacent a corner of the first square shaped portion 23.

The second plate member 20 includes a substantially circular shaped portion 27 and a substantially centrally disposed cylindrical portion 28. The cylindrical portion 28 is fixedly connected to the circular shaped portion 27 and extends outwardly of the lower face 21 of the second plate member 20. The outer diameter of the circular shaped portion is slightly smaller than the diameter of the first aperture 24.

The third plate member 22 includes a second substantially square shaped portion 30 provided with a substantially centrally disposed third aperture 32 and four fourth apertures 34 each of which is disposed adjacent a corner of the second square shaped portion 30. The third aperture 32 is of larger diameter than the second elongate portion 14. The fourth apertures 24 are of similar diameter to the second apertures 26.

The first and second plate members 18, 20 fit together with the upper surface 19 of the first plate member 18 adjacent the lower surface 21 of the second plate member 20, so that the cylindrical portion 28 of the second plate member 20 engages with the first aperture 24 in the first plate member 18 as shown by the arrows A in Figure 3.

The third plate member 22 is placed over the second plate 20 as shown by the arrows B in Figure 3 such that the first, second and third plate members 18, 20, 22 are disposed relative to each other as best shown in Figure 7. The first, second and third plate members 18, 20, 22 are fixed relative to each other by adjustable connection means 36, in this example nut and bolt arrangements which pass through the second and fourth apertures 26, 34 in the first and third plate members 18, 22 respectively. The adjustable connection means 36 act to restrict rotation of the first and third plate members 18, 22 relative to each other and to selectively permit or restrict rotation of the second plate member 20 and thereby the second elongate portion 14 about an axis perpendicular to the upper surface 19 of the first plate member 18.

It will be understood that when the adjustable connection means 36 are relaxed, the second plate member 20 and the second elongate portion 14 connected to the second plate member 20 are free to rotate relative to the first and third plate members 18, 22 and thereby relative to the first elongate portion 12, whilst the first and third plate members 18, 22 remain fixed relative to each other. When the adjustable connection means 36 are engaged, the second elongate portion 14 and the second plate 20 are not free to rotate relative to the first and third plates 18, 22. In order to facilitate rotation, it will be understood that the diameter of the third aperture 32 is sufficiently large to permit 360° rotation of the second portion 14 free of restriction.

The interconnecting means 16 may include a second fixing means provided by the use of a pin member 38. In this embodiment, the second plate member 20 includes two fifth apertures 40.

The fifth apertures 40 are arranged oppositely about the cylindrical portion 28, and are substantially equidistant from the cylindrical portion 28. The distance from the fifth apertures 40 to the centre of the cylindrical portion 28 is greater than the radius of the second elongate portion 14 and less than the radius of the third aperture 32 as seen in Figure 1.

A plurality of sixth apertures 42 are provided within the first plate member 18. The sixth apertures 42 are of similar diameter to the fifth apertures 40. The distance from each sixth aperture 42 to the centre of the first aperture 24 is substantially the same as the distance from the fifth apertures 40 to the centre of the cylindrical portion 28.

The fifth and sixth apertures 40 and 42 are arranged such that when the first and second plate members are disposed at particular orientations, a fifth aperture 40 is aligned with a sixth aperture 42, thus providing a hole within which the pin member 38 may be engaged.

In normal use, the elongate member 10 locates in a first orientation as shown in Figures 1 and 7 wherein the first and second elongate portions 12, 14 are substantially parallel to each other and the light source 11 is disposed at a location relatively remote from the base position 13.

When it is desired to service or replace the light source 11, the pin member 38 is removed and the adjustable connection means 36 are released but not completely disengaged so as to permit rotation of the second plate member 20 relative to the first and third plate members 18, 22. As a result, the elongate member 10 is free to be moved by a user to a second orientation as shown in Figure 8 wherein the second elongate portion 14 is disposed at an angle, which may be substantially 90°, relative to the first elongate portion 12 and the light source 11 is located in a position closer to the base position 13. The pin member 38 may then be inserted into a fifth aperture 40 which is aligned with a sixth aperture 42.

It will be understood that by appropriate selection of the location of the interconnecting means relative to the first and second elongate portions 12, 14, the distance between the second elongate portion 14 and the base position 13 when the elongate member 10 is in the second orientation may be selected so that the second elongate portion 14 is disposed sufficiently close to the base position 13 to allow a user to service or replace the light source 11 whilst still being held sufficiently remote

from the base position 13 to avoid potential injury to persons adjacent the elongate member 10 should the fixing means fail when the elongate member 10 is in the first position.

It will be understood that in the above described example, electrical wires would be provided to supply electrical power to the light source 11. The wires may pass internally of the first and second elongate portions 12, 14 from the base position 13 to the light source 11. In this way, the wires are less likely to be damaged during use.

It will be appreciated that whilst in this embodiment the first and second elongate portions 12, 14 are substantially cylindrical, they may be formed of members of any suitably shaped cross-section, for example square shaped cross-section, the important aspect being that the outer surface of the second elongate portion 14 does not restrict rotation of the second elongate portion 14 within the third aperture 32 of the third plate member 22.

Modifications and variations as would be apparent to a skilled addressee are deemed to be within the scope of the present invention.

CLAIMS

1. An elongate member for locating an article remote from a base position,
5 characterised in that the elongate member comprises a first elongate portion, the first
elongate portion extending, in use, from the base position, a second elongate portion,
the second elongate portion being arranged to receive the article, and interconnecting
means, the interconnecting means being arranged to connect the first elongate portion
10 to the second elongate portion and to permit relative rotation of the first and second
portions about an axis of rotation, the axis of rotation being disposed at an acute angle
relative to a longitudinal axis of the first elongate portion.

2. An elongate member according to Claim 1, characterised in that the acute
angle is between 30° and 60°.

3. An elongate member according to Claims 1 or 2, characterised in that the
interconnecting means includes a first plate member fixedly attached to the first
elongate member at an end remote from the base position, and a second plate member
fixedly attached to the second elongate member of an end remote from the article
20 wherein, in use, the first plate member is located adjacent the second plate member.

4. An elongate member according to Claim 3, characterised in that the first plate
member has an upper surface and the second plate member has a lower surface, the
upper surface of the first plate member being adjacent the lower surface of the second
25 plate member in use, and the axis of rotation is perpendicular to the upper surface of
the first plate member.

5. An elongate member according to Claim 3 or 4, characterised in that the
interconnecting means includes a fixing means, the fixing means arranged to
30 releasably engage the first plate member and the second plate member such that, in
use, when the first and second plate members are engaged by the fixing means
relative rotation of the first and second elongate members is restricted.

6. An elongate member according to Claim 5, characterised in that the fixing means includes a third plate member, the third plate member including a centrally disposed aperture and being arranged to locate, in use, about the second elongate portion and adjacent the second plate member, wherein adjustable connection means is arranged to connect the first plate member and the third plate member such that tightening of the adjustable connection means engages the fixing means.

7. An elongate member according to any one of Claims 3 to 6, characterised in that the first plate member has at least one aperture, and the second plate member has at least one aperture, and wherein the aperture of the first plate member is adjacent to the aperture of the second plate member when the first elongate portion and the second elongate portion are arranged in a particular position, and wherein the interconnecting means includes a pin member arranged, in use, to locate within the aperture of the first plate and the aperture of the second plate and thus restrict relative rotation of the first elongate member and the second elongate member.

8. An elongate member according to Claim 7, characterised in that the second plate member has a first aperture and a second aperture and wherein rotation of the second elongate member relative to the first elongate member causes an aperture of the first plate member initially adjacent the first aperture of the second plate member to be subsequently adjacent the second aperture of the second plate member.

9. An elongate member according to any one of the preceding Claims, characterised in that the interconnecting means includes a cylindrical portion arranged to be coaxial with the axis of rotation, and wherein the cylindrical portion extends from one of the first and second elongate portions and wherein the other of the first and second portions includes an aperture arranged to receive the cylindrical portion.

10. An elongate member according to any one of the preceding Claims, characterised in that the article includes a light source.

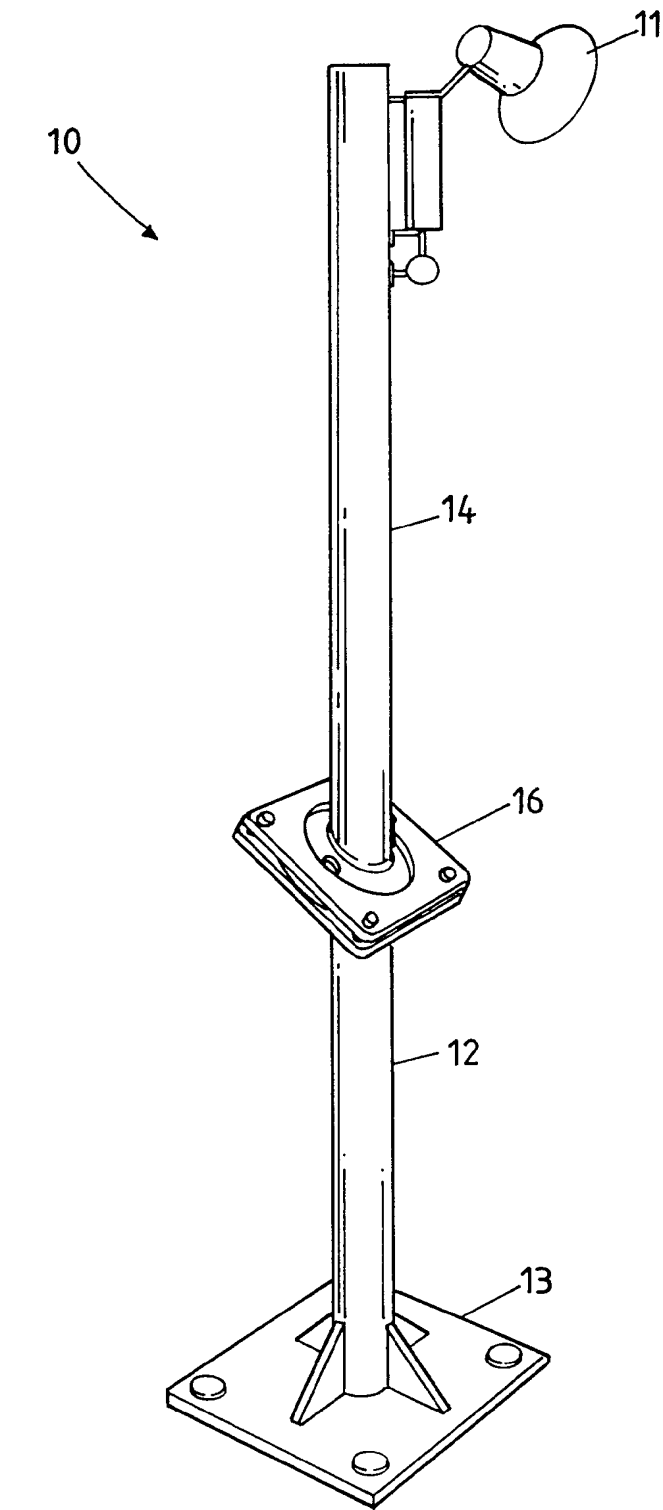
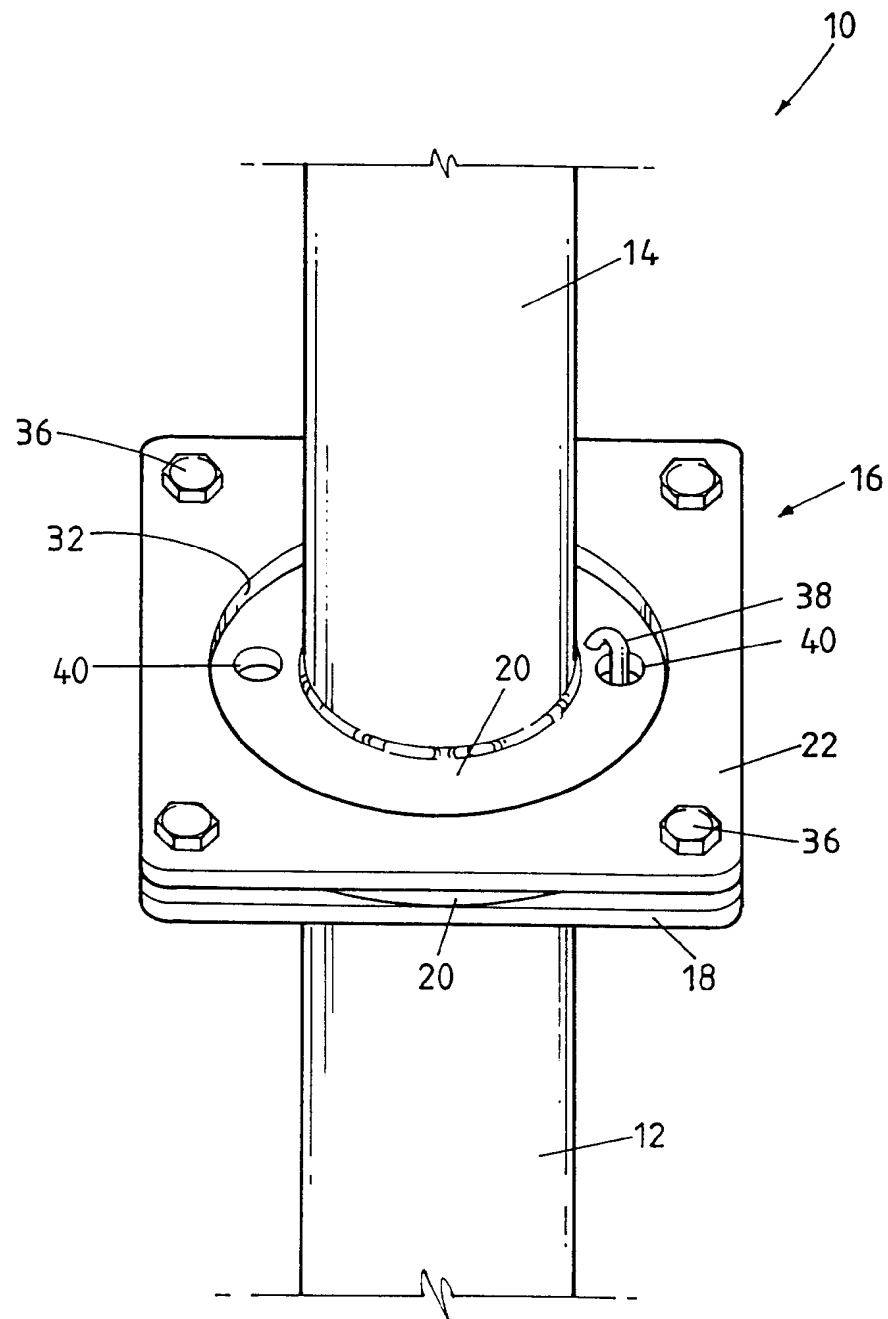


FIG.1

217



3/7

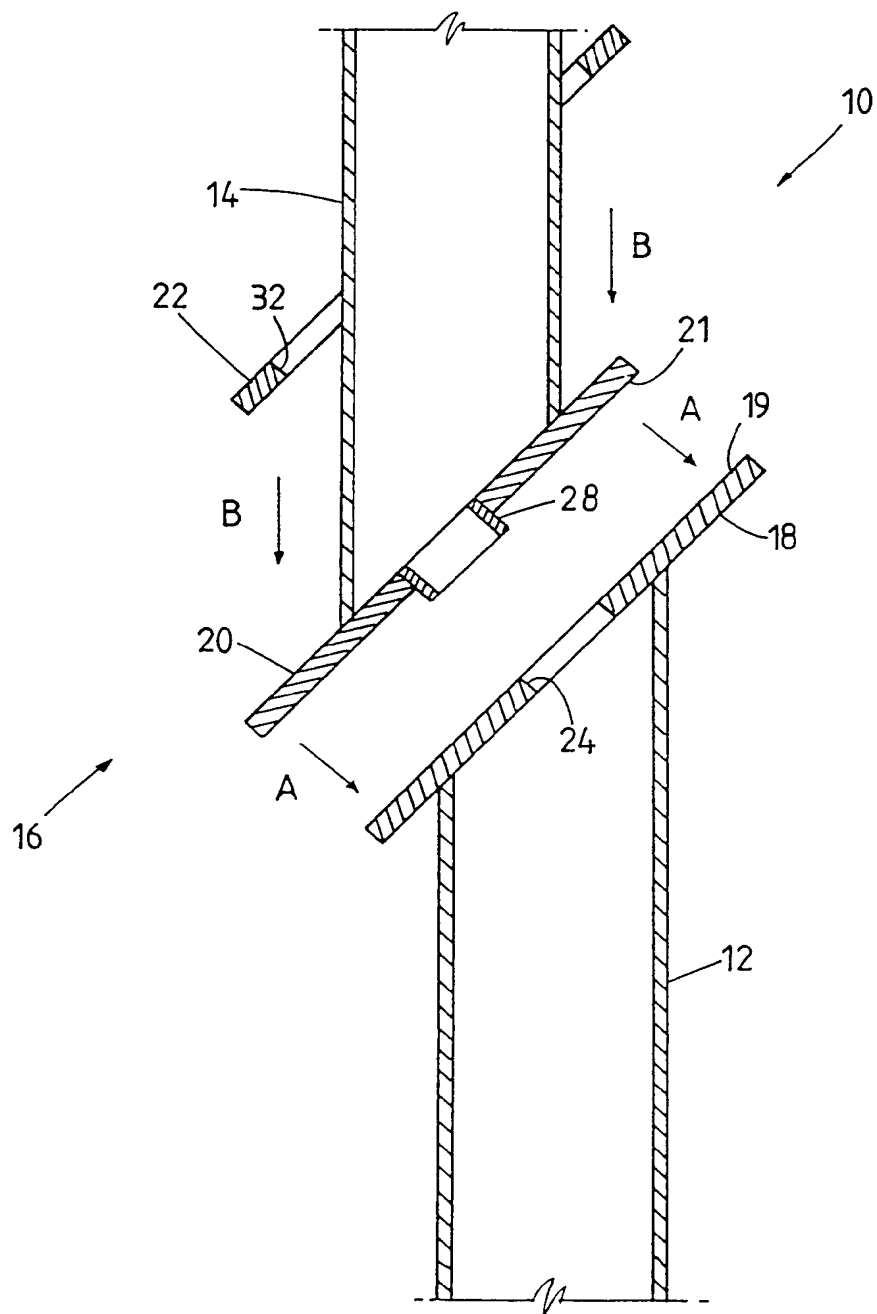


FIG. 3

4/7

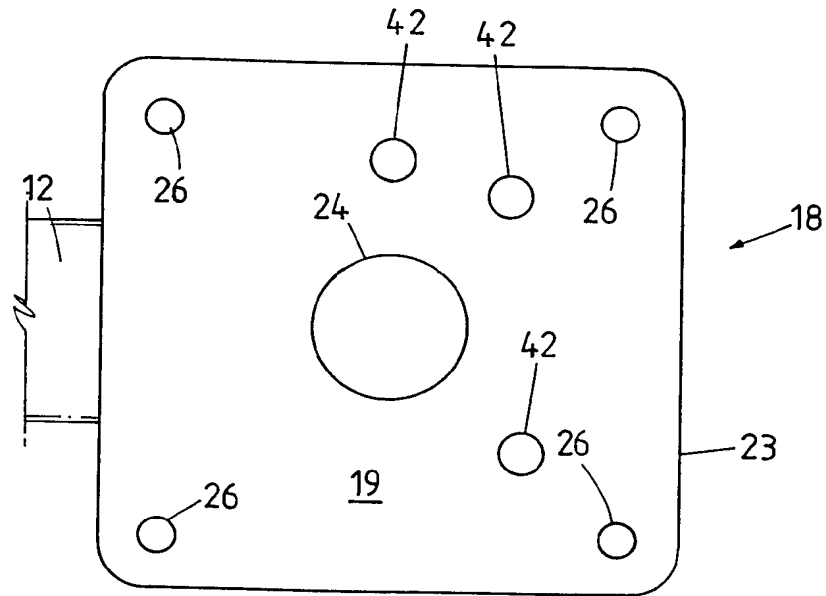


FIG. 4a

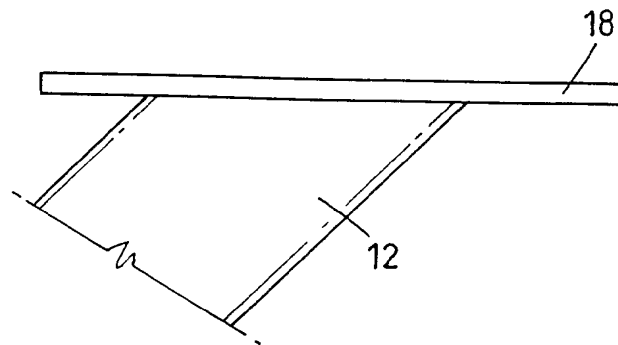


FIG. 4b

5/7

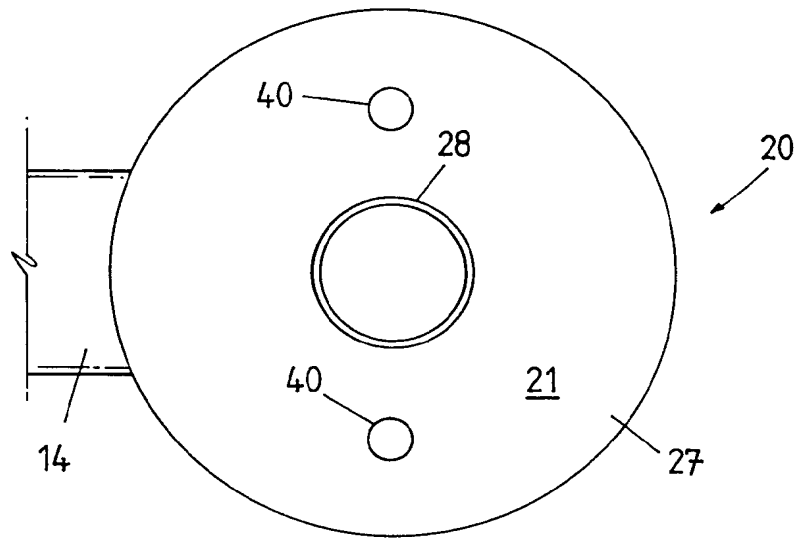


FIG. 5a

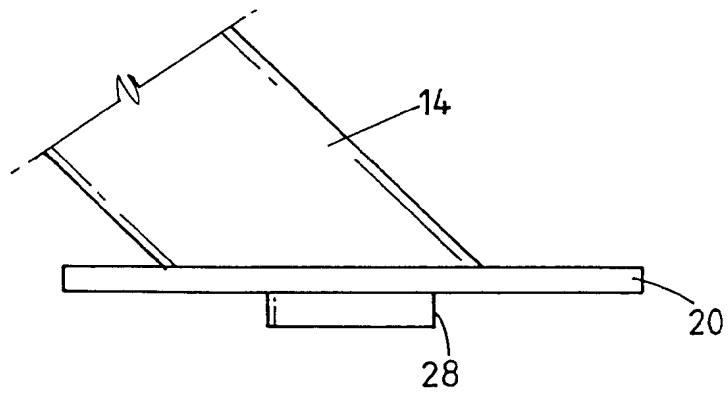


FIG. 5b

6/7

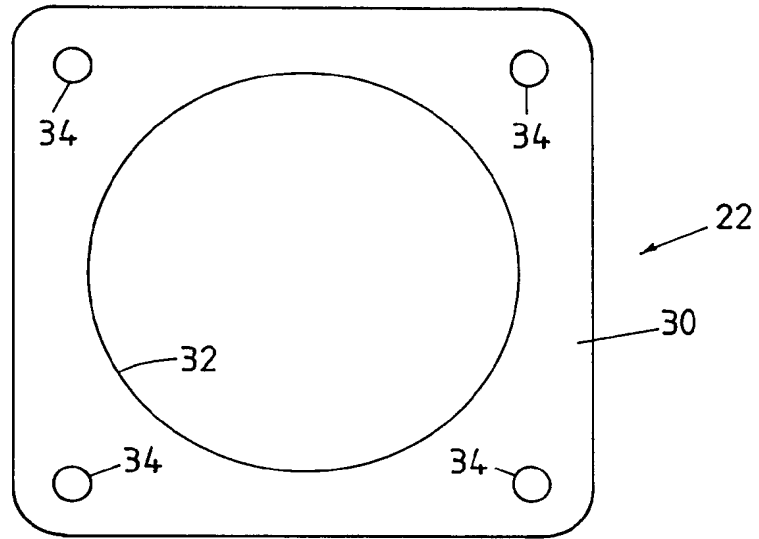


FIG. 6a



FIG. 6b

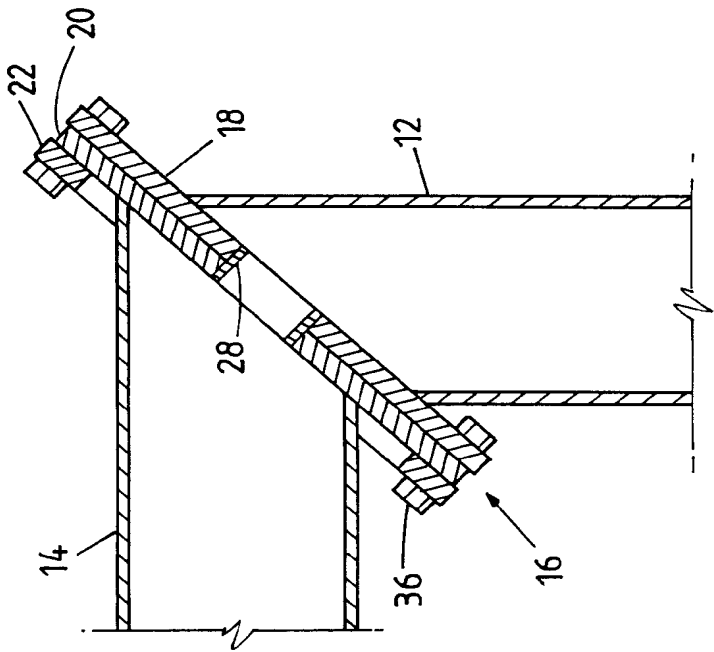


FIG. 8

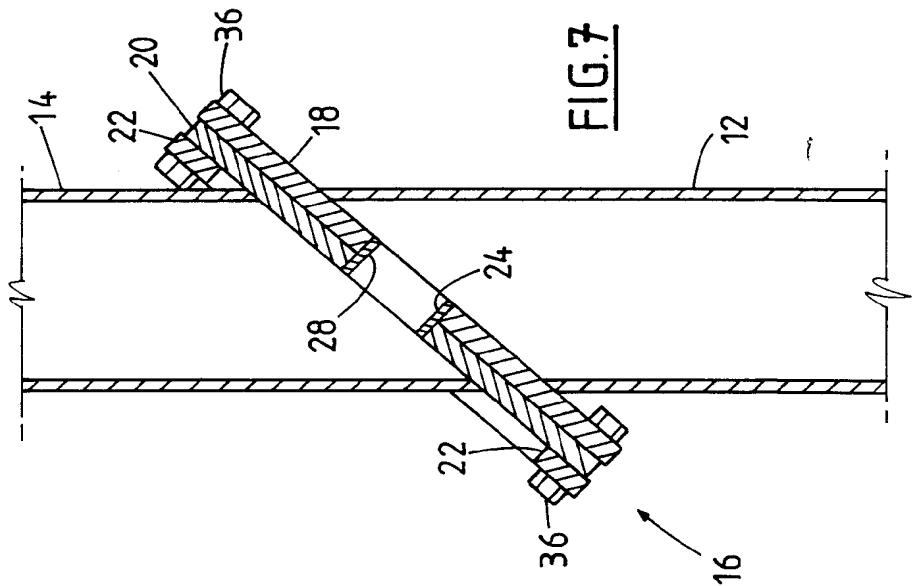


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU00/01208

A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl. ⁷ F21V 21/36, E04H 12/18, 12/34		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
Int. Cl. ⁷ F21V 21/36, E04H 12/18, E04H 12/34, F16L 27/-		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) DWPI, JAPIO, IFIPAT: Int.Cl. as above with rotat+, turn+, angle+, angular+, pivot+, swivel+, upper and lower, pole?, mast?, antenna?, lamp+, light+, interconnect+, interjoin+, clamp+, section+		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	DE 2733571 A (KESSEL) 8 February 1979	
X	Whole document	1 - 5
Y		10
	DE 2918532 A (PATENT-TREUHAND-GESELLSCHAFT FÜR ELEKTRISCHE GLÜHLAMPEN MBH) 20 November 1980	
X	Whole document	1 - 5, 9 - 10
	GB 1581928 A (ROTAFLEX [GREAT BRITAIN] LIMITED) 31 December 1980	
X		1 - 5, 9 - 10
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 31 October 2000		Date of mailing of the international search report - 7 NOV 2000
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929		Authorized officer RAJEEV DESHMUKH Telephone No : (02) 6283 2145

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU00/01208

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3355847 A (PRATT) 5 December 1967	10
	Whole document	
A	US 2629465 A (RHEA) 24 February 1953	
	Whole document	
A	US 2577811 A (RUTLEDGE) 11 December 1951	
	Whole document	
A	US 2199897 A (STRINGER) 7 May 1940	
	Whole document	

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/AU00/01208

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report			Patent Family Member				
DE	2733571	NONE					
DE	2918532	NONE					
GB	1581928	AU	27427/77	BE	857127	CH	617256
		DE	2733447	FR	2360037	IT	1116643
		NL	7708351				
US	3355847	NONE					
US	2629465	NONE					
US	2577811	NONE					
US	2199897	NONE					
END OF ANNEX							